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THE

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EDITORIAL.

The Malayan Tea Industry.

The development of the tea industry in Malaya has been accompanied by growing pains that are both severe and prolonged. Schemes for the extended planting of tea in the lowlands and the development of the highlands on the completion of the road to this area more or less coincided with the inauguration of control of tea planting by the International Tea Committee. Malayan views on the development of her young industry were adjusted by agreement with this Committee and we were then confronted by a new situation consequent upon war conditions whereby exports to the United Kingdom—our principal market—could be effected only by contracts with the Ministry of Food.

While these measures of control are inevitable and may on occasions tend to annoy, we would record appreciation of the helpful co-operation of the United Planting Association of Malaya and of producers which has been evident and which has assisted in the smooth working of the schemes which have been under the administration of the Tea Controller and the Tea Commissioner.

It is customary for us to review annually in this journal the progress of the Malayan tea industry, and in conformity with this practice we include an article in this number concerning the tea industry in 1940.

The main features brought out in this review are that the area has increased by some 2,000 acres, production now stands at over 1,600,000 lbs., while Malayan consumption of tea included 16 per cent. of locally grown tea. The total consumption of tea in Malaya exceeds 6 million lbs., and it is therefore evident that there is still room for the exploitation of this outlet for the produce of this country.

Contracts for 1941 with the Ministry of Food will probably absorb a little more than 1 million lbs. Total production, however, should be in the neighbourhood of 2 million lbs., so that a market has to be found for 50 per cent. of our production. We may confidently anticipate that the local market will absorb the bulk of this surplus, so that as matters stand at present there will be little opportunity of developing other markets. With the present shipping situation, exports other than to the Ministry will probably be beset with difficulties, but should it be possible to find shipping space we have evidence that a ready market could probably be found for Malayan tea in the middle East.

Cultivation Experiments with Oil Palms.

Experiments designed to compare the effect on yield of natural covers and clean weeding have been continued by the Department over several years. The earlier records showed that the clean-weeded areas resulted in an increased yield over the areas planted with natural covers, but the reader was cautioned against considering this as a final judgment as it was thought probable that the increased yield might be due to the effect of the application of the green matter, and of cultivation.

Subsequent investigations, which are described in this number, show that this view of the matter was correct, for, after four years, the yields from the clean-weeded areas have declined and are likely still further to deteriorate, while the temporary decrease in yield which followed the "forestry" treatment was not apparent in the fourth year and the author considers further that it is probable that this loss in yield will be more than made up by increased yields during the fifth and subsequent years.

We must, of course, withhold final judgment in this matter till we are in possession of statistical evidence to support it, but present indications point to the fact that as with coconuts and rubber, the ultimate conclusion will be that it is essential to keep the land covered with vegetation to protect the soil from the fierce action of the sun, to conserve plant nutrients in the soil, and to prevent soil erosion.

Growing Papaya as a Dessert Fruit.

This Department recently published a Leaflet on the papaya. For the reason that Leaflets of the Department are not circulated outside Malaya, while much of the information given has not hitherto been published by the Department, we reprint in this place the Leaflet. The cultivation of the papaya should commend itself to all householders. It may be grown with the greatest of ease, and is a nutritious and pleasant fruit. Many people hesitate to plant fruit trees in their gardens, as they seldom benefit by their labour. The papaya should appeal, therefore, for it promises quick results.

Original Articles.

THE MALAYAN TEA INDUSTRY IN 1940

By
D. H. Grist,
Agricultural Economist.

Prices.

Tea prices in London are no longer quoted, due to the fact that under tea control regulations now in force the Ministry of Food is the sole importer of tea, at prices arranged between the Ministry and the estates concerned.

The average prices for 1940 of tea sold by Malayan estates in contract with the Ministry of Food were 12.855d. per lb. for highlands and 11.985d. per lb. for lowlands, freight and insurance from Malayan ports being met by the Ministry.

The Ceylon Brokers' Association state that the average prices per lb. for 1940 for Ceylon tea were as follows:—High Grown Teas 94 cents (59 cents), Medium Grown Teas 80 cents (51 cents), and Low Grown Teas 74 cents (47 cents) as compared with 84 (54), 76 (48), and 71 (45) cents respectively in 1939. The figures in brackets are the equivalent price in Malayan currency, the figures outside the brackets being the quoted price in Ceylon currency.

The Tea Agreement.

It will be recalled that an agreement was reached in 1939 between Malaya and the International Tea Committee, whereby the total area to be planted with tea in Malaya during the period of the Agreement, to terminate on 31st March 1943, would be limited to an area which might be expected to produce the equivalent of Malaya's probable future tea consumption. It was anticipated that an additional 10,000 acres would be sufficient to ensure this object, giving a total area of 14,716 acres under this crop.

Before the end of 1939 licences were issued to cover planting in 1939 and 1940, and the balance reserved for these applicants, to whom in due course licences will be issued to cover 1941 and 1942-43 (to end of March) provided that they have fulfilled the planting programme for 1939 and 1940.

A number of additional applications for planting rights were received during the year under review and were held over pending the examination of the position at the end of the year. In the light of annual returns submitted by all estates it has been necessary to refuse all new applications for planting licences.

Sale of Tea in the United Kingdom.

From 13th March 1940 the Ministry of Food took over all imports of tea into the United Kingdom and from that time it became impossible to export tea to the United Kingdom except on sale by contract to the Ministry of Food.

The Adviser on Agriculture was appointed by the Ministry as Tea Commissioner, Malaya, to negotiate contracts and arrange shipments and payments on behalf of the Ministry. Under this arrangement four lowland estates exported a total of 376,456 lbs. of tea and four highlands estates 258,374 lbs. of tea to the Ministry, a total of 716,046 lbs. for the contract year which ended on 15th February 1941. The contract price was fixed for five estates based on the average price obtained over the previous three years with certain adjustments. Prices to be paid for tea from the three remaining estates are to be fixed on valuations in London.

Negotiations are in progress for the sale of Malayan tea to the Ministry on contract for the year 1st January 1941 to 15th February 1942, a total of 1,051,000 lbs. being offered for shipment by Malayan estates.

While some delay was inevitable in inaugurating this scheme, due largely to the uncertainty of mails, the scheme has operated smoothly. Difficulty was experienced at one juncture in obtaining shipping space, but this was overcome.

In October it was announced that tea could be despatched as gifts to the United Kingdom, on payment of the import duty, provided that the tea was an unsolicited gift, was consigned direct to the private individual in the United Kingdom, and complied with the parcel post regulations.

Certain estates were inundated with orders, to the embarrassment of certain post offices that were unable to deal with the number of parcels of tea. To overcome this difficulty and to cope with what was largely a Christmas trade, permission was obtained from the Ministry to despatch parcels of gift tea in bulk for posting in the United Kingdom. The Tea Commissioner signed permits for 2,103 parcels containing a total of 12,810 lbs. of gift tea under this arrangement. The concession was withdrawn by the Ministry on 10th March 1941 and, as amended, gift tea must now be limited to 2 lbs. per parcel, and must be sent by parcel post.

Area under Tea.

The total area planted with tea in Malaya, showing years of planting, is given in Table 1. It will be noticed that the figures for years previous to 1937 differ from those given in the review of the industry for 1939.* The present figures are compiled from questionnaires sent to all estates at the end of 1940, and may therefore be considered the more accurate. The table includes an area of 533 acres, estimated to be planted on small Asiatic-owned holdings, principally in one area in Selangor.

Of the total area of 4,968 acres of upland tea, 4,913 acres are situated at Cameron Highlands.

There are 16 estates with over 100 acres of tea planted, 10 of which are in the highlands. Six estates have over 500 acres each, 4 have between 250 and 500 acres, and 6 have between 100 and 250 acres each planted with tea.

The distribution of the lowland area, by States, is as follows:—Selangor 2,493 acres, Perak 488 acres, Pahang 6 acres, Negri Sembilan 23 acres, Kedah 868 acres, Johore 50 acres, and Penang 2 acres.

* *Malayan Agricultural Journal*, Vol. XXVIII No. 5, May 1940.

Table 1.

Total Area Planted with Tea, Malaya.

(acres)

	Before 1930	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	Total Area	Reserve Land
Upland areas ...	98	325	164	86	43	52	269	336	663	1,125	480	1,327	4,968	6,032
Lowland areas ...	1,620	188	63	6	—	6	81	88	220	580	335	743	3,930	2,243
Total ...	1,718	513	227	92	43	58	350	424	883	1,705	815	2,070	8,898	8,275

The total area planted with tea at the end of 1940 was 8,898 acres, of which 2,070 acres were planted during the year under review. For the second year in succession unseasonal weather affected the planting programme. On the other hand, certain important estates were able, with the permission of the Tea Controller, to accelerate their programme of planting.

Of the total area under tea, approximately 214 acres were stated to be seed-bearers and 128 acres nurseries, of which 84 acres of seed-bearers and 83 acres of nurseries were in the highlands. These figures are included under the area of tea shown in Table 1.

Production.

The total production of tea in 1940 amounted to 1,633,854 lbs., of which 886,554 lbs. were lowlands tea and 747,300 lbs. highlands tea. The figure for lowland tea includes an estimated production of 240,000 lbs. from small holdings from which no annual returns are available. A close inspection of these small areas was made during the year, and judging by the observed condition of the bushes and of the slight improvement in cultural operations, it is considered that an estimated production of 450 lbs. per acre continues to be a fair estimate of the crop. The production of lowland tea by States, excluding the above-mentioned computed production on small holdings, was in 1940:— Perak 125,955 lbs., Selangor 528,682 lbs., Negri Sembilan 5,537 lbs., Pahang 1,600 lbs., Kedah 184,780 lbs.

While crops have been adversely affected by weather conditions, the figures of yields during 1940 again confirm the opinion that yields in the highlands are higher than expected, while the original estimate of yield rates in the lowlands was rather too optimistic. An estimate of future yields of estates, prepared in 1938, placed the probable yield of upland tea in 1940 at 659,000 lbs. and lowland tea 1,205,000 lbs., a total of 1,864,000 lbs., whereas actual production was 1,573,854 lbs. Detailed figures of estate crops and their disposal are given in Table 2.

Table 2.

Production and Distribution of Malayan Tea.

(Estates only)
in lbs.

Year	Upland			Lowland			Total		
	Produced	Exported	Sold Locally	Produced	Exported	Sold Locally	Produced	Exported	Sold Locally
1930	—	—	—	95,040	35,730	59,310	95,040	35,730	59,310
1931	—	—	—	127,988	31,000	95,662	127,988	31,000	95,662
1932	4,382	—	3,161	138,694	16,472	123,101	143,076	16,472	126,262
1933	39,440	6,990	29,958	172,449	59,952	118,997	211,889	59,942	148,955
1934	115,874	44,072	64,510	228,497	74,843	152,789	344,371	118,915	217,299
1935	212,927	163,787	30,431	418,735	238,189	173,583	631,662	401,976	204,014
1936	327,796	253,308	79,162	616,970	397,074	210,788	944,766	650,382	289,950
1937	373,767	183,026	182,431	627,304	400,026	229,113	1,001,071	583,052	411,544
1938	507,654	292,296	198,978	709,652	455,007	235,646	1,217,306	747,303	434,624
1939	558,619	265,403	286,211	754,475	382,468	332,261	1,313,094	647,871	618,472
1940	747,300	273,176	434,565	826,554	389,687	404,311	1,573,854	662,863	838,876

Stocks of Tea on Estates.

Since stocks of tea on estates as declared at the end of 1939 were placed at 138,297 lbs., and production during the year 1940 1,573,854 lbs., the total amount of tea for disposal during the year was 1,712,151 lbs. With 1940 exports at 662,863 lbs. and 838,876 lbs. disposed of locally, stocks at the end of 1940 should be 210,412 lbs. The actual stocks declared at the end of 1940 were, however, 211,904 lbs., of which 80,848 lbs. were highland tea and 131,056 lbs. lowland tea.

Imports and Exports.

As stated above, tea exports to the United Kingdom have been subject to control; there was, however, no control of exports to other countries, and efforts were made to introduce Malayan tea to new markets.

The total annual imports and exports of both black and green tea for the past 9 years are given in Table 3.

The feature of these comparative figures is the very great increase in 1940 in the imports of green tea. Imports from China increased from 941,903 lbs. in 1939 to 2,948,480 lbs., and from the Netherlands Indies from 875 lbs. to 120,113 lbs. The position was carefully examined, as a result of which from early in 1941 an import quota was applied on the basis of average imports during the 5 years 1935 to 1939.

Table 3.

Malayan Imports and Exports of Tea.

Year	Black				Green			
	Imports		Exports		Imports		Exports	
	Quantity lbs.	Value $	Quantity lbs.	Value $	Quantity lbs.	Value $	Quantity lbs.	Value $
1932	4,000,680	895,417	501,771	170,298	970,974	301,165	26,500	10,715
1933	2,915,530	700,941	511,048	163,882	855,188	328,040	19,053	10,949
1934	3,913,753	984,881	649,092	220,247	1,210,555	489,707	32,973	17,496
1935	3,573,056	1,033,184	898,457	316,066	1,451,331	536,285	66,374	29,217
1936	3,466,463	872,681	1,158,275	463,912	1,668,492	536,267	81,087	38,132
1937	3,842,393	998,620	1,133,090	557,719	2,038,923	664,515	67,597	38,553
1938	3,468,409	1,068,351	1,297,552	622,412	1,367,939	371,353	72,879	39,208
1939	4,071,187	1,281,732	1,417,674	682,405	950,119	281,252	69,825	39,737
1940	3,152,860	1,183,261	1,208,916	690,295	3,099,342	963,145	83,833	46,492

The annual imports and exports of tea for the past 18 years are given in Table 4.

Table 4.
Malayan Gross Imports and Exports of Tea.
(Black and Green)

Year	Imports		Exports	
	Quantity lbs.	Value $	Quantity lbs.	Value $
1923 ...	8,214,477	2,881,612	1,397,233	490,348
1924 ...	8,424,413	3,246,735	1,348,139	463,386
1925 ...	9,127,297	3,634,414	1,301,457	496,087
1926 ...	11,198,158	4,538,650	1,533,349	591,037
1927 ...	10,777,692	4,541,898	1,238,497	499,997
1928 ...	9,973,161	4,285,495	1,325,721	516,354
1929 ...	11,377,857	4,388,726	1,225,435	503,451
1930 ...	9,693,851	3,284,692	961,398	412,472
1931 ...	7,516,051	1,924,707	670,303	259,063
1932 ...	4,971,654	1,196,582	528,271	181,013
1933 ...	3,770,718	1,028,982	530,101	174,831
1934 ...	5,124,308	1,474,588	682,065	237,743
1935 ...	5,024,387	1,569,469	964,831	345,283
1936 ...	5,134,955	1,408,948	1,239,362	502,044
1937 ...	5,881,316	1,663,135	1,200,687	596,272
1938 ...	4,836,348	1,439,704	1,370,341	661,620
1939 ...	5,021,306	1,562,984	1,487,499	722,142
1940 ...	6,252,202	2,146,406	1,292,749	736,787

Consumption.

The local consumption of tea may be computed from the trade statistics of imports and exports and from the declared local production disposed of in this country. It is not known, however, what quantities of tea are in stock in warehouses and shops from one year's end to another and it is possible, therefore, that the apparent consumption in any one year may be inaccurate. The total consumption in 1940 was apparently 6,701,192 lbs., as compared with 5,040,149 lbs. in 1939. It is probable that war conditions have affected the stock position and that actual consumption, while fully up to last year's figure may be less than the figure stated in Table 5.

Table 5.

Malayan Consumption of Tea.

lbs.

Year	Imported Tea*	Malayan Estate Tea†	Malayan Small-Holders' Production (Estimated)	Total	Percentage Malayan Consumption produced locally.
1930 ...	8,768,183	59,310	250,000	9,077,493	3.4
1931 ...	6,876,748	95,662	250,000	7,222,410	4.8
1932 ...	4,459,855	126,262	250,000	4,836,117	7.8
1933 ...	3,300,559	148,955	250,000	3,699,514	10.8
1934 ...	4,561,158	217,299	250,000	5,028,457	9.3
1935 ...	4,461,532	204,014	250,000	4,915,546	9.2
1936 ...	4,545,975	289,950	250,000	5,085,925	10.6
1937 ...	5,263,681	411,544	250,000	5,925,225	11.2
1938 ...	4,213,219	434,624	250,000	4,897,843	14.0
1939 ...	4,181,677	618,472	240,000	5,040,149	17.0
1940 ...	5,622,316	838,876	240,000	6,701,192	16.1

* Imports — (Exports — Exports Malayan tea).

† Sales for local consumption as declared by estates.

While local sales of Malayan tea increased, the percentage of Malayan consumption produced locally declined by nearly 1 per cent., due to the marked increase in quantities of imported tea. There remains further scope for Malayan teas on the local market and one effect of the present disruption of trade on account of the war may well be that local tea will find wider favour in this country.

Received for publication 18th April 1941.

A COMPARISON BETWEEN NATURAL COVERS AND CLEAN-WEEDING ON YIELDS OF OIL PALMS

By
A. B. Lucy,
Agriculturist.

Introductory.

A description of this experiment, together with yields up to the end of 1939, was published in this Journal in April 1940. The present paper carries the experiment on another year and brings the records up-to-date. This further account of the experiment is published only a year after the original article because the experiment has now reached a critical stage. The yields have followed anticipated trends and having diverged significantly from the control have now returned to a common level, but with such abruptness that it appears certain that the apparent relative advantages of the different treatments, so pronounced in the 3rd year, and now nullified in the 4th, will be reversed in the 5th and successive years.

Cultivation Treatments.

There are three treatments which were commenced in March 1937. They are:—

(a) Clean-weeding. Monthly weeding rounds have been maintained for 4 years and the surface soil now possesses a hard, bare, rain-washed appearance.

(b) Slashing. The natural undergrowth is slashed back close to the ground every 4 months.

(c) "Forestry" method. By means of selective weeding, and trimming to a height of about 4 ft. twice a year, the composition and quantity of vegetation is suitably controlled. The ground between the palms is now well covered with Nephrolepis fern and forest shrubs and seedlings, and when the vegetation is cut back every 6 months a protective mulch of leafy branches falls to the ground.

Manurial Application.

In February 1940 a dressing of rock phosphate at the rate of 4 lbs. per palm was broadcast over the whole area. Apart from this no manure had been applied since the previous dressing of rock phosphate in 1936.

Observations on the Palms.

The palms are growing in a sandy loam soil of rather low fertility, and a certain amount of leaf bronzing and premature die-back has been in evidence on all the plots since the commencement of the experiment. But during the last 12 months the appearance of the palms on the clean-weeded plots has become progressively worse, whereas the appearance of those on both the slashed and "forestry" plots has remained almost unchanged.

Yield of Fruit Bunches.

A summary of the yields is shown in Table I. These figures are expressed as percentages of the yields from the slashed plots in Table II.

Table I.

Mean Yields of Fruit Bunches from Plots of 30 Palms.

Treatment	Sept. 1936 to Feb. 1937*	March to Dec. 1937	Jan. to Dec. 1938	Jan. to Dec. 1939	Jan. to Dec. 1940
	lbs.	lbs.	lbs.	lbs.	lbs.
Clean-weeded ...	2,271	3,412	4,218	5,359	3,350
Slashed ...	2,212	3,363	3,537	4,268	3,241
'Forestry' method ...	2,215	3,253	3,149	3,659	3,160

* Preliminary period of experiment.

Table II.

Mean Yields of Fruit Bunches for Different Treatments Expressed as Percentages of Yields from the Slashed Plots.

Treatment	Sept. 1936 to Feb. 1937*	March to Dec. 1937	Jan. to Dec. 1938	Jan. to Dec. 1939	Jan. to Dec. 1940
Clean-weeded ...	102.6	101.5	119.3	125.6	103.3
Slashed ...	100.0	100.0	100.0	100.0	100.0
'Forestry' method ...	100.1	96.7	89.0	85.7	97.5

* Preliminary period of experiment.

The crop harvested during 1940 was appreciably smaller than that of the previous year for all three treatments. Two reasons are offered to explain this fall in yield. Firstly, the rock phosphate applied in 1936 was undoubtedly a contributory factor to the relatively high yield in 1939, whereas its effect had probably been spent before the beginning of 1940. The dressing given in February 1940 could not be expected to have any effect upon yield until the following year. Secondly, weather conditions were apparently less favourable than in 1939 since the yield from other adjacent regularly manured palms fell off in 1940.

Discussion.

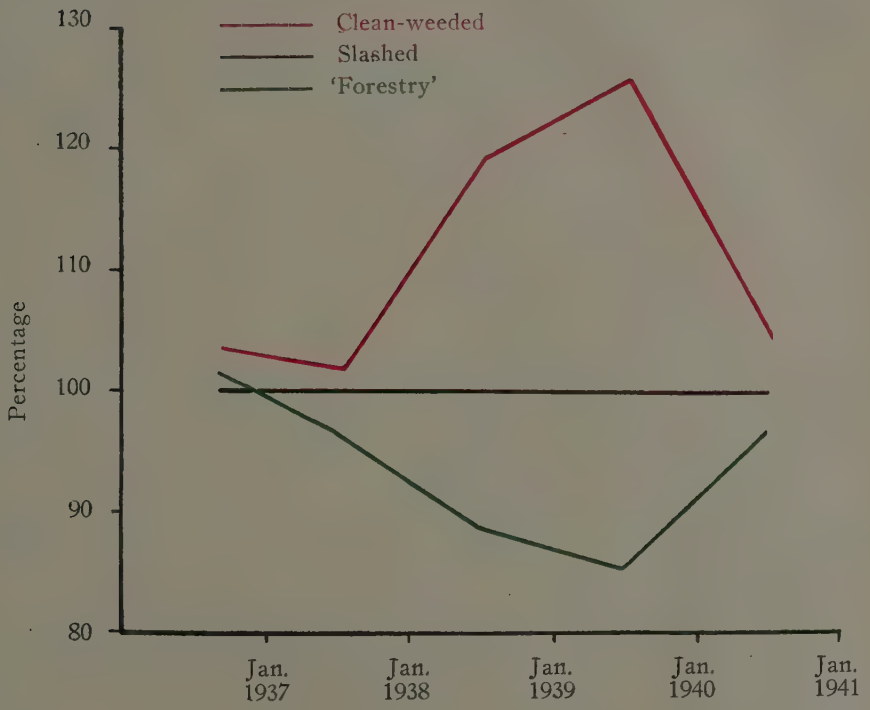
During 1940 the mean yields from all three treatments were approximately the same. But whereas the yield from the slashed plots is following a relatively steady course, the yields from the clean-weeded and 'forestry' plots are following definite, opposite, trends. This is brought out very clearly in the accompanying diagram where yields expressed as percentages of the yields from the slashed plots are represented graphically.

The graph shows clearly how the yields from the clean-weeded plots increased steadily in the 2nd and 3rd years but fell off very abruptly in the 4th year. There is little doubt but that the yield will be far below that of the slashed plots in the 5th and subsequent years. The explanation of the temporary increase followed by a decline in yield was suggested in the original article already referred to. It was that a temporary addition of humus and plant nutrients resulted from the decay of the natural undergrowth, but with the exposure of the soil to the action of sun and rain the physical structure of the soil has steadily deteriorated. Now that this temporary addition of nutrients has been exhausted, and the physical condition of the soil is worse than at the commencement of the experiment, it follows logically that the yield will show a further decline.

The graph of the yields from the 'forestry' plots contrasts very sharply with that of the clean-weeded plots. A gradual decline in yield took place in the 2nd and 3rd years but in the 4th year the yield was back to normal. The graph points to yields greater than those from the slashed plots in the 5th and subsequent years. The trend of this graph has followed anticipated lines. During the first 12 or 18 months most of the undergrowth was allowed to grow freely with very little cutting back. During this period competition with the oil palms for plant nutrients must have been much keener than before, when the undergrowth was kept in check by frequent slashing. But during the third and subsequent years a considerable amount of organic matter has been returned to the soil in the form of leaves, twigs, branches and 'undesirable' plants, and the undergrowth has been checked by 6-monthly trimming. At the same time there has been a good cover to the soil, giving protection from the harmful action of sun and rain and resulting in a gradual improvement in its physical condition. Inspection of the plots at the present time shows that below the 'forestry' undergrowth the soil is relatively moist and soft and easy to penetrate with a stick, whereas on the clean-weeded area the surface is hard and dry and resistant to the penetration of both a stick and rainwater.

On the clean-weeded plots the silt pits invariably fill with water after every storm. The finer particles of silt and clay are carried by the surface run-off into the pits, where they are deposited to form an impervious layer. The result is that the silt pits often retain water for several weeks, and they would thus become breeding places for malarial-carrying mosquitoes if oiling was not undertaken. On the other hand, where there is a good cover of natural undergrowth the surface run-off is almost negligible and silt pits are unnecessary.

YIELDS OF OIL PALM BUNCHES EXPRESSED AS PERCENTAGES OF YIELDS FROM SLASHED PLOTS.



Note. For convenience the annual yields are shown at the mid-yearly points.

Conclusion.

The experiment shows that although there was an increase in yield of fruit bunches from the clean-weeding treatment, this increase was only temporary, whereas the decline in yield which will almost inevitably follow is likely to be permanent. On the other hand the temporary decrease in yield which followed the adoption of the 'forestry' treatment was not apparent in the 4th year, and it seems probable that this loss in yield will be more than made up by increased yields during the 5th and subsequent years.

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PAPAYA. *

(Carica papaya)

The papaya, or pawpaw as it is sometimes called, is cultivated in all tropical countries. It is grown as a dessert fruit, also for the preparation of papain used as a digestive in medicinal preparations. Papain is obtained by drying the latex which exudes when the unripe fruits are tapped.

The fruit has a high carotene content (the precursor of Vitamin A) and has also a high antiscorbutic value, *i.e.*, Vitamin C.

In Malaya the papaya, known as *betek*, is considered a common *kampong* fruit. In some country districts the young leaves and shoots are eaten as a green vegetable. Reference 1 may be consulted.

The present leaflet deals only with the cultivation of the tree for fruit production.

Description of Tree.

The papaya is a fast growing, semi-herbaceous, usually branchless tree attaining a height of 10 to 25 ft. and possessing a fleshy, hollow, erect trunk which bears a crown of large palmate leaves.

The fruits are borne on short stalks on the stem immediately below the crown of leaves, and may vary in shape from round to oblong. The fruit has a central cavity, on the walls of which are attached the seeds, which vary greatly in number. The wall of the fruit may be pink or orange in colour, is very succulent, and is the portion of the fruit consumed as dessert.

Individual fruits show considerable variation in weight; fruits weighing up to 10 lbs. have been recorded. Large fruits are unpopular, medium-sized fruits weighing from $1\frac{1}{2}$ to $3\frac{1}{2}$ lbs. being preferable for dessert purposes.

The papaya normally produces male and female flowers on separate plants. Occasionally, however, flowers of each sex are produced on the same plant, and sometimes the plant is found with both sex elements present in the same flower. These intermediate forms are hermaphrodite and may produce small distinct fruits, containing seeds, on long racemes known to Malays as *betek rambai*.

Varieties.

In addition to the ordinary type of papaya, there are three special varieties of this fruit established at the Central Experiment Station, Serdang. Brief descriptions of these varieties are as follows:—

(a) *Singapore.* An elongated, pear-shaped fruit with no very marked corrugations, but with a fairly pronounced nipple at the stylar end. Skin light green, turning yellow as the fruit ripens. Seeds many. Flesh golden. Fruits 2 to 3 lbs. in weight.

* Agricultural Leaflet No. 22. Department of Agriculture, S.S. & F.M.S.

This variety has separate male and female flowers, which are easily distinguished in the flowering stage. In the case of the female plants, the flowers are large and occur singly on a short stalk in the axil of the leaf; the petals of the flowers are not joined in a corolla tube. The male plant on the other hand produces many smaller flowers on a much-branched stalk borne in the axil of the leaf and the corolla of each flower is united to form a corolla tube.

(b) *Hawaiian Breakfast.* A rounded, pear-shaped fruit with fairly well-shaped corrugations and a fairly blunt stylar end. Skin light green, turning yellow as the fruit ripens. Seeds very few and almost entirely confined to the lower half of the fruit cavity. Flesh golden. Fruits 1½ to 2½ lbs. in weight.

This also is a variety with distinct male and female plants, the distinguishing characters of which are the same as those described for the Singapore variety.

(c) *Semangka.* An elongated oblong fruit with no very marked corrugations and a fairly blunt stylar end. Skin light green, turning yellow as the fruit ripens. Flesh pink. Seeds fairly numerous. Fruits 2½ to 3½ lbs. in weight.

In the case of this variety each flower possesses male and female elements.

Seed Selection.

Selected papaya seed, particularly that of varieties possessing separate male and female plants, generally produces a mixed population of seedlings bearing a variety of types of fruits. While a large proportion of the fruits will conform to the varietal description, it must be anticipated that some of the fruit will vary and seeds from such fruits should obviously not be selected for future propagating purposes. The Semangka variety, however, generally breeds true to type.

Soil and Situation.

The papaya tree thrives best in a light or medium loam rich in organic matter. The tree is not suited to heavy soils and is particularly intolerant of badly-drained situations. It is very susceptible to wind damage and should therefore be cultivated in sunny but sheltered areas.

Sowing of Seed.

The papaya is propagated from seed. The period of germination varies from 5 to 15 days if fresh seed is used; if the seed is dry this period may be extended up to two months.

The number of seeds per oz. varies from about 250 to 500 according to the degree of freshness.

Seed may be germinated in boxes, if only a small area is to be planted, or in nursery beds, if cultivation is to be on a large scale.

If boxes are used, the germinating medium should consist of one part sifted coir dust and one part sifted sand or one part sifted leaf mould or compost and one part sifted sand. The seedlings should remain in this medium until they are large enough to handle and then should be pricked out into another box at intervals of 2

to 3 ins., using as a medium a sifted leaf mould and sand mixture in equal proporations. There should be sufficient depth of this mixture in the box to allow ample room for root development.

When the seedlings become established and begin to grow, the box should be exposed to the sun for gradually increasing periods each day until the seedlings are thoroughly hardened and can stand transplanting to their permanent positions in the field.

If the seed is germinated in beds, the soil should be thoroughly cultivated to a very fine tilth. If possible, well-rotted cattle manure or compost should be applied at the rate of 10 lbs. per sq. yd. and wood ash at the rate of 2 ozs. per sq. yd. The seed should be sown in rows about 12 ins. apart with 2 to 3 ins. between individual seeds, covered with a thin layer of fine soil and thoroughly watered. The nursery bed should be protected from the rain and the direct rays of the sun and for this purpose a shelter of palm leaves should be provided. Just before the seedlings are ready for transplanting they should be hardened off by gradually reducing the intensity of the shade.

Transplanting.

Seedlings are ready for transplanting when they are from 3 to 4 ins. high. Some hours before transplanting the seedlings should be liberally watered so that they can be easily lifted with a ball of moist earth around their roots. Transplanting should be done in the cool of the day, preferably in the evening, so as to minimize the danger of the seedlings wilting beyond recovery. Trimming of the leaf blades assists in reducing the effects of the shock of root disturbance.

The seedlings should be transferred to previously prepared planting holes spaced at intervals not less than 7 ft. apart. The holes should be at least 18 ins. deep and 18 ins. in diameter and should be filled with a mixture of well-rotted cattle manure or compost (say a basketful) and good soil. Each hole should be overfilled so that when the soil eventually settles no depression will be formed. The seedlings (see below) should be set in the centre of each hole and no deeper than when grown in the box or nursery bed. The soil should be pressed firmly around the roots and the seedlings thoroughly watered. The provision of a temporary shade of palm leaves for each planting point is essential if severe losses are to be avoided. The shade should be removed gradually after the seedlings have become thoroughly established and begin to throw out new growth.

Selection of Plants.

There is no certain method of distinguishing between male and female plants in the seedling stage. When planting varieties possessing separate male and female plants *e.g.*, Singapore and Hawaiian Breakfast, is is advisable to plant say two seedlings per hole so as to give scope for selection and elimination. When the seedlings have begun to flower and their sex can be determined, elimination so as

to leave only one plant per point should be undertaken. In order to ensure sufficient pollen for the female flowers one male plant for every 15 to 20 female plants should be retained.

In the case of the Semangka yariety which has male and female elements on the same plant there is no need to plant more than one seedling per hole. This is also the case with the ordinary type in which failure of fruit to set is most exceptional owing to the presence of perfect flowers sufficient for the pollination of the female ones. Pollination is effected by night-flying moths which may also carry pollen from distant trees.

Budding has been proved by local trials to be easy but owing to the rapidity of growth of the trees this form of propagation has so far not been undertaken on a large scale. It is, however, a matter for further investigation with the object of securing uniform plantings of desirable clones and making full use of seedlings established, including male trees.

Assuming the original planting holes to have been spaced 7 ft. apart square and one tree to be left per point this planting arrangement would give approximately 890 trees per acre.

Cultivation and Manuring.

The papaya tree is a heavy feeder and to maintain the trees in health and productivity they should receive an annual application of 30 to 40 lbs. (say a basketful) of well-rotted cattle maure or compost. If neither of these is available or the material is considered too expensive an application of 2 lbs. of a mixture of the following composition is suggested:—

	parts by weight.
Groundnut cake	3
Rock phosphate	2
Muriate of potash	1
Lime	1

Whichever manure is employed it should be envelope-forked or lightly dug in around the base of a plant to the limit of leaf spread. In doing this care should be taken to damage the roots of the tree as little as possible.

It cannot be too strongly emphasized that the papaya tree is a heavy feeder and requires regular manuring to yield crops of fruit. The tree also benefits from a mulch and during weeding rounds the weeds should be spread and allowed to rot under each tree.

Pests.

The two most important insect pests of papaya are the scale *Aspidiotus orientalis* Newst. and the fruit fly, *Strumeta pedestris* Bez.

The female scale of *Aspidiotus orientalis* Newst. is flat, circular, about 1.5 mm. in length and brownish with a transparent margin. The male scale is smaller and broadly oblong. Though it has parasitic and predaceous enemies, this scale has been observed almost completely covering the trunk, fruits and leaves of papaya.

As a control measure spraying the infested tree with kerosene emulsion is recommended though this insecticide may be applied to the trunks effectively by 'painting.'

Information concerning the fruit fly and its control has recently been published in some details under the name of *Chaetodacus ferrugineus* F. Reference 2 may be consulted. Special attention should be paid to clean cultivation, which includes removal of host plants, wild or cultivated, the fruits of which are liable to be infested with fruit flies, to the disposal of injured and infested fruits, to the use of Jarvis and formaldehyde baits as attractants and, if necessary, to the bagging of fruits. The immature papaya fruits are not attacked by fruit flies.

Diseases.

During wet weather papaya trees are often attacked by a root and collar rot due to species of the fungi Pythium and Phytophthora. The tissues at the base of the stem disintegrate with a moist rot and the tree may fall over. Occasionally, the fruits also are attacked by Phytophthora, becoming covered with a white mould, and decay.

The treatment recommended for the root rot is to dig out and burn all decaying root and stem tissue and to drench the soil in the site with Burgundy mixture or Cheshunt compound.† The soil around the roots of adjacent papaya trees should be watered with either of the above fungicides if the trees are not already attacked by the disease. In the case of the fruit rot, affected trees are best removed, as attempts to cure the rot (which rapidly invades the top of the stem) are usually unsuccessful. Spraying the fruits, leaves and stems of adjacent trees with Burgundy mixture as a preventive measure is advisable if the weather continues to be wet. The pink-fleshed papayas are much more susceptible to these diseases than the golden-fleshed varieties.

Papayas growing on light soil are also liable to attack by "leaf spot" (*Helminthosporium* sp.) in dry weather, particularly if growing near to large trees which compete with them for soil moisture. Under these conditions the papaya trees may die back but can be saved if watered thoroughly daily.

Yields.

Fruit is produced more or less continuously throughout the year, but yields are generally somewhat heavier in March/May and September/November than during the intervening periods.

A papaya tree begins to bear fruit at 10 to 12 months from planting, yields heavily during the first year, falls off in the second and third years, and should be replaced in the fourth year. At 4 to 5 years old a tree yields very few fruits and these are expensive to harvest as ladders have to be used.

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† Burgundy mixture:—copper sulphate 4 lbs., washing soda 5 lbs., water 40 gallons.

Cheshunt compound:—copper sulphate 2 parts by weight, ammonium carbonate 11 parts by weight. These chemicals are crushed to a fine powder, mixed and kept in a closed jar for 24 hours. 1 oz. of the mixture is dissolved in 2 gallons of water.

In its first year of bearing a tree growing in a suitable environment should yield from 20 to 25 fruits, the number gradually falling off to only a very few as mentioned above. The rate of reduction in yield will depend to a marked extent on the cultivation and manuring which the trees receive.

Quality of Fruit.

Of the three varieties mentioned, the heaviest yielder is the Singapore variety, but in flavour the other golden-fleshed variety, Hawaiiian Breakfast, is generally considered superior. The Semangka variety with its pink-fleshed fruit commands the highest price in the local markets.

References.

Articles containing information on papaya referred to in the text are obtainable at a price of 50 cents each, post free, from the Agricultural Economist, Department of Agriculture, S.S. & F.M.S., Kuala Lumpur.

(1) Malay Leaf and Other Vegetables and Their Analyses. Special Bulletin, General Series No. 31, 1940.

(2) Fruit Flies. *Malayan Agricultural Journal,* Vol. XXVIII, No. 3, 1940.

CONDITIONS ON RUBBER SMALL HOLDINGS IN MALAYA.

1st Quarter, 1941.

Prepared by the Economics Branch of the Department of Agriculture, S.S. & F.M.S., in collaboration with the Field Branch of the Department.

Rainfall.

In most parts of the country weather conditions approximated to normal, *i.e.* a dry January with moderate to heavy rainfall in February and March. In several districts of Johore these conditions were reversed and January was a wet month with drier conditions in the two succeeding months. In Kelantan heavy rains were experienced in the first half of February, but thereafter until the end of the quarter drought conditions prevailed. In Pahang also March was very dry and hot, but heavy rains fell in the coastal districts during January and February.

Prices.

Prices paid for small-holding rubber during the quarter were on a lower level than those ruling in the previous quarter, falling lowest in February when the general market price eased considerably. Tables I and II summarize the position during the period under review.

In Province Wellesley and Penang uncouponed rubber was sold at $20 to $23 per picul. In Perak South uncouponed scrap was sold at $7 to $9 per picul, and in Johore from $5 to $11.50.

The general range of coupon values was $21 to $25 per picul equivalent, though in some parts of the country extremes were $18 to $19 and $26.

Production and Tapping.

Production of small-holding rubber during the quarter under review is shown in Table III. There was a further fall in production due to various factors, *e.g.* heavy rains in some localities, "wintering", the incidence of padi harvesting, and a shortage of coagulants in some districts.

The usual quarterly survey of small holdings was made at the end of the quarter to estimate the percentage of holdings out of tapping, and the results are summarized in Tables IV and V. Although production fell off for the reasons already mentioned, it will be seen that there was only a slight increase in the percentage of holdings out of tapping when compared with the previous quarter, due to the fact that when the survey was made holdings had come back into tapping.

In Selangor the "bagi dua" system remains the common method of paying tappers, the owners paying for the hire of mangles and tappers paying for the acid. The cost of smoking, if any, is deducted by the owner before sharing out. In Ulu Langat District, where a few Malays have commenced paying daily wages to tappers, the pay is 70 cents daily for a task of 250 trees.

Table I.

Lowest and Highest Rubber Prices Paid by Local Rubber Dealers.

(In Malayan dollars per picul of 133 1/3 lbs.)

1st Quarter, 1941.

Quality	Perak	Penang	Selangor	Negri Sembilan	Pahang	Malacca	Kedah	Johore	Kelantan
				JANUARY					
Smoked sheet	44.00-45.00	40.00-46.50	41.50-46.20	41.00-47.00	40.00-46.50	42.50-47.50	43.00-46.20	41.00-46.00	39.50-42.80
Unsmoked sheet	41.00-46.00	36.50-44.50	38.00-43.50	38.00-45.00	38.00-44.30	40.50-46.00	41.00-45.00	39.80-45.00	37.75-40.80
Scrap	27.00-33.00	30.00-32.00	29.00-30.50	—	—	31.50-35.00	28.00-32.50	26.50-32.60	24.00-26.50
				FEBRUARY					
Smoked sheet	42.00-44.50	38.50-45.00	41.00-44.50	41.00-45.00	38.00-47.50	42.50-46.00	41.00-44.00	39.50-46.00	37.50-43.75
Unsmoked sheet	40.00-44.00	37.00-43.00	38.00-44.00	39.00-43.00	36.00-42.60	40.50-44.50	39.50-42.50	38.00-44.50	36.00-41.75
Scrap	20.00-30.00	30.00-32.00	28.00-30.00	—	—	31.00-35.50	27.00-30.00	26.70-36.00	23.50-27.00
				MARCH					
Smoked sheet	42.00-48.00	41.50-45.60	41.00-46.60	41.50-46.00	40.00-45.20	45.00-47.55	41.00-46.20	40.00-45.80	37.50-44.33
Scrap	41.00-46.00	38.00-44.00	37.00-44.50	38.00-43.80	38.80-42.70	43.25-45.50	39.50-44.70	38.50-44.50	36.00-42.33
Unsmoked sheet	25.00-32.00	32.00-33.50	27.50-29.00	—	—	32.00-35.00	27.00-31.00	28.00-36.50	24.50-28.00

Table II.

Mean of Lowest and Highest Rubber Prices Paid by Local Dealers at a number of Centres in each State.

(In Malayan dollars per picul of 133 1/3 lbs.)

1st Quarter, 1941.

Quality	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah	Johore	Kelantan
				JANUARY					
Smoked sheet	44.25-44.75	41.69-44.88	41.98-44.80	42.10-46.26	42.10-44.84	43.63-45.07	43.63-45.80	42.33-45.20	40.88-42.65
Unsmoked sheet	42.12-44.00	39.44-42.15	39.50-42.50	39.60-43.50	39.30-42.87	41.83-43.33	41.62-44.25	40.71-43.45	37.88-40.53
Scrap	28.67-31.00	30.00-32.00	29.00-30.50	—	—	32.67-33.50	28.67-32.17	28.33-30.37	24.25-26.00
				FEBRUARY					
Smoked sheet	43.00-44.25	40.79-43.38	41.95-43.58	41.70-43.70	40.64-43.74	43.23-44.67	41.69-43.25	40.74-43.18	39.38-42.12
Unsmoked sheet	41.25-42.88	39.09-41.04	39.00-42.33	39.60-42.00	38.30-40.88	41.50-43.00	39.88-41.62	39.29-41.49	37.63-40.12
Scrap	25.00-25.83	30.00-32.00	28.00-30.00	—	—	31.83-33.67	28.83-29.67	27.89-29.90	24.50-25.75
				MARCH					
Smoked sheet	44.75-46.00	42.41-44.92	42.19-45.30	42.16-45.26	41.40-44.20	45.97-47.05	43.30-45.20	41.84-44.38	40.41-42.91
Unsmoked sheet	42.75-44.75	40.06-42.66	39.43-42.50	39.06-42.96	39.56-42.14	43.75-45.10	41.35-43.18	40.16-42.84	38.66-40.91
Scrap	28.00-30.33	32.00-33.50	27.50-29.00	—	—	32.67-34.20	28.33-30.33	30.00-33.04	25.25-27.00

Table III.

Production of Rubber on Small Holdings.

(in tons)

	Total 1940	1st Quarter 1940	1st Quarter 1941
Federated Malay States	102,986	22,637	19,432
Straits Settlements	15,694	3,781	3,944
Unfederated Malay States	96,239	21,973	22,446
TOTAL MALAYA ...	214,919	48,391	45,822

Quality of Rubber and General Conditions on Holdings.

"Wintering" took place during the quarter, and in some parts of the Peninsula was prolonged and irregular.

In Pahang conditions on holdings continue to be satisfactory for the most part, and advice on soil erosion measures and cover cropping is meeting with response. Old holdings are generally under natural cover periodically slashed, but on new and replanted areas leguminous covers are often adopted. In West Pahang, however, the dry weather has prevented the sowing of cover-crop seed.

Kuantan (Pahang) dealers refuse to purchase unsmoked sheet, and such sheet in East Pahang is sold in Jerantut where prices are better than in Pekan, despite the long journey. A further 10 smoke houses were erected in Kuantan, bringing the total to 103 of which 75 per cent. are in active use. In Pekan two new cabinets were erected but two were abandoned, the total remaining at 70, of which only 45 per cent. are in regular use.

In Selangor, Chinese owners have complained of a shortage of labour for weeding. Weeding labourers (male) now demand from 80 cents to $1 per day, and females from 60 to 70 cents. For such work as planting budded stumps, up to $1.20 per day is demanded.

Six smoke cabinets were in operation at Jenderam, Selangor, where the premium for smoked sheet ranged from $1.50 to $3 per picul, and five at Jeram where the premium varied between $2 and $3. The majority of Malay small-holders in Selangor prefer to have their rubber smoked in dealers' smoke houses at 50 cents to $2 per picul, depending on local circumstances. Usually the cost is below $1, and

Table IV.

Estimated Acreage of Tappable Rubber which was out of Tapping on Holdings of less than 100 Acres at the end of March, 1941.

PERAK				SELANGOR				NEGRI SEMBILAN				PAHANG			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Batang Padang	36,187	6,200	17	Klang	16,143	4,400	27	Seremban	23,639	15,100	64	Raub	10,534	5,700	54
Kinta	38,874	7,400	19	Kuala Langat	23,881	4,800	20	Tampin	21,896	8,800	40	Kuala Lipis	15,457	1,200	8
Kuala Kangsar	92,166	10,100	11	Ulu Langat	45,012	10,400	23	Kuala Pilah	31,832	10,500	33	Bentong	12,224	1,200	10
Upper Perak	15,590	3,400	22	Ulu Selangor	31,463	8,200	26	Jelebu	9,097	1,300	14	Other Districts†	40,373	9,700	21
Larut & Selama	43,132	nil	nil	Kuala Lumpur	20,277	3,200	16	Port Dickson	11,133	6,700	60				
Krian	9,408	6,300	67	Kuala Selangor†	8,417	1,800	21								
Lower Perak†	26,735	4,000	15												
Dindings	9,873	2,800	28												
	271,965	40,200	15		145,193	32,800	21		97,597	42,400	43		84,588	17,800	21

MALACCA				PENANG & P. WELLESLEY				SINGAPORE			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Central	14,093	3,400	24	North	3,549	1,300	38	Singapore	20,115	800	4
Alor Gajah	30,838	19,400	63	Central	10,785	2,800	26				
Jasin	25,286	4,800	19	South	8,936	1,100	12				
				Penang	15,822	900	6				
	70,217	27,600	39		39,092	6,100	16		20,115	800	4

JOHORE	350,007	24,500	7
KEDAH	102,126	12,300	12
KELANTAN	49,133	15,200	31
PERLIS	2,916	5,600	18
TRENGGANU ‡	29,836		

The percentage of areas out of tapping in December, 1940, was as follows:—Perak 14, Selangor 20, Negri Sembilan 45, Pahang 18, Malacca 25, Penang and Province Wellesley 15, Singapore 2, Johore 8, Kedah 8, Kelantan 23.

†Estimated from percentage for other Districts in the State.

‡Estimated from percentage for rest of Malaya.

Table V.

Comparisons of Areas of Rubber Small Holdings Out of Tapping

	March, 1940		December, 1940		March, 1941	
	Acres	Percentage	Acres	Percentage	Acres	Percentage
F.M.S. ...	198,000	33.0	125,500	21.0	133,200	22.2
S.S. ...	29,200	22.0	23,700	18.3	34,500	26.7
U.M.S. ...	89,700	17.0	52,700	9.9	57,600	10.8
Malaya ...	316,900	25.0	201,900	16.0	225,300	17.8

the practice is thus an economic one. Unsmoked sheet is normally sold when small-holders are dealing in small parcels of rubber for ready cash and thus unable to accumulate sufficient for smoking.

The Malacca report states that the condition of holdings leaves much scope for improvement, and replanting of most holdings appears to be necessary. The system of tapping is heavy on the bark and prolonged resting to encourage bark renewal is rarely given. The sheet prepared is of average good quality, but smoking is still not done by the small-holder but left to the Chinese dealers.

In Perak Central the improvement in the general condition of holdings noticed previously continues; many owners have slashed undergrowth and dug very necessary drains. There is little or no improvement in the general position regarding soil erosion. Many replanted areas have been sown with cover crops and a few owners have terraced under the instruction of the Asiatic Rubber Instructors.

The Negri Sembilan report states that a very large proportion of small-holders now undertaking replanting are adopting anti-soil erosion measures such as terracing, platform planting and establishing cover crops. A small-holder was fined $10 under the Anti-Malarial Enactment for having constructed his terraces with a backward slope.

Planting and Budgrafting.

The planting of new areas has now ceased, but replanting is still reported from many States and also the budding of newly-planted and replanted areas. All available budding material from Agricultural Station nurseries is eagerly sought after and bought as soon as it is old enough. In some localities estates have been very willing to help in the supply of budwood.

Most of the budding in East Pahang was done by Malay budders trained by the Department. In Kuantan it is reported that good results have been obtained by using pieces of coconut leaf to cover the budpatch in lieu of the more expensive waxed cloth. A number of Malays in Temerloh received permission to replant but have been handicapped by shortage of barbed wire for fencing.

In Kelantan a number of *kampong* Malays were trained to do budding in anticipation of work in April.

The Selangor report states that some shortage of fertilizers was experienced, no R.R.I. Mixture E being available although the alternative mixture was obtained in some cases, while requirements of Christmas Island rock phosphate were also filled. Bat guano was available at $2.80 per picul and is favoured by many small-holders.

In Selangor visits of small-holders interested in replanting were arranged on two occasions to see budded areas on estates. Many owners, however, are still inclined to plant clonal seed or budded stumps when they observe European estates in their neighbourhood following these practices.

Pests and Diseases.

Following "wintering" mild outbreaks of *Oidium Heveae* have been reported in various parts of the country.

Mouldy Rot was less in evidence generally during the quarter under review owing to the dry weather conditions experienced. In Selangor large-scale joint purchase of fungicide for the control of this disease was organized by one of the Malay Rubber Instructors.

"White ants" and giant snails damaged some new plantings, and monkeys and wild pig were destructive to newly-budded stands at Temerloh, Pahang.

Observations on root disease in Kinta District, Perak, have been concluded and a final report has been submitted. The six plots were visited by the Pathologist, R.R.I.

Root disease continues to be reported from various parts of the Peninsula, and in Upper Perak high winds uprooted a large number of trees whose roots had been attacked. Some replanted areas in Sitiawan, Perak, continue to suffer from root disease because old diseased roots were not dug out before replanting. Root disease was also troublesome in new and replanted rubber on holdings in the Batu Pahat and Kluang Districts of Johore.

General.

Some reports mention catch-cropping with foodstuffs on new and replanted areas. An excellent catch crop of hill padi was obtained from rubber land in Sitiawan, Perak.

In Pahang requisitioning of lorries for military use affected marketing to Kuala Lumpur during the early part of March, especially in the case of Bentong and Raub.

The Selangor report mentions that petrol rationing and commandeering of lorries have affected prices to some extent. Formerly the difference in price between Kuala Lumpur and Kajang was negligible, but now it is 20 to 30 cents per picul due to transport charges. Lorry hire is now $7 per trip as compared with $3 before petrol rationing commenced. The Bandar and Jugra Co-operative Society ceased selling in Klang owing to the increased cost of transport.

Malay budders trained by the Malay Instructor, Ulu Langat, are now obtaining contract work. The courses conducted by the Instructor at Jenderam and Beranang, which embrace also tapping and manufacture, are continuing.

The Malacca report, referring to the economic position of the small-holder, points out that there is now more scope for outside employment, and that it is common for a small-holder to obtain work in the afternoon as a labourer on large neighbouring estates when he has completed work on his own holding.

Reports from the Segamat District, Johore, indicate that there was not the usual demand for latex. The principal buying company was not purchasing the same quantity as formerly with the result that a number of the collecting centres were abandoned. The price ranged from 18½ to 19 cents per kati (d.r.c.) as compared with 20 to 22 cents during the last quarter.

Several reports mention a shortage of coagulants, and Departmental sales were recommenced at a number of centres. With this shortage, undesirable types of coagulants at high prices were more in evidence. In Kajang, Selangor, the prosecution of a shopkeeper, whose "90 per cent. formic acid", when tested was found to contain 53 per cent. sulphuric acid, is reported to have had a deterrent effect in that locality.

Adequate supplies of approved acids were available in Kelantan, and approximately 250 demijohns of acid were purchased and resold by the Department during the quarter. About 42,000 latex cups were purchased for resale to smallholders on an instalment basis and stocks of sieves were also held for resale.

An Asiatic Rubber Instructor in Johore reports that he has received many enquiries regarding the application of palm oil to the tapping panel to encourage more rapid bark renewal and healing of wounds caused by careless tapping. It is suggested that persons interested in disposing of surplus oil are exaggerating its properties. Enquirers were acquainted with its proper use and with the results obtained from trials carried out by the Rubber Research Institute.

QUARTERLY REPORT ON THE MALAYAN PINEAPPLE CANNING INDUSTRY

December 1940 to February 1941.

Prepared by the Economics Branch of the Department of Agriculture, S.S. & F.M.S., from Reports of Field Officers.

Factories.

There are 20 registered factories in Malaya, four of which are peeling sheds. This total is made up as follows:— Singapore 5, of which one cans juice only; Johore 9 factories and 3 peeling sheds; Selangor 3, of which one is a peeling shed.

In Singapore the four pineapple factories worked throughout the quarter but on a reduced output basis. The juice-canning factory started on the 10th January and operated throughout the quarter.

In Johore three factories were in operation during the quarter, but worked intermittently during January and February.

In Selangor one factory and the cutting shed operated until the 23rd January. The remaining factory did not operate during the quarter.

Prices.

It was reported that petrol rationing and recent commandeering of lorries were being given as reasons for payment of low prices in the field, estimated to average 50 cents per 100 fruits of average size and quality. Enquiry lent some support to these statements of cut prices by the middlemen dealers, but as no complaints of a cut in prices by factory owners were received, the matter did not come within the jurisdiction of the Central Board. The cutting of prices by dealers could best be dealt with by the Growers' Association, and until such Association is in a position to deal with the problem it is difficult to see what effective action can be taken. Difficulty of effective action is increased by the fact that many of the holdings are scattered and inaccessible.

A pool has been established, operating retrospectively from 1st January 1941, into which is paid for the benefit of growers 32 cents per case of Golden grade, 25 cents for G.A.Q., and 12 cents for 2nd quality. The reason for the formation of this pool is to ensure that growers shall get their fair proportion of increased prices as compared with those anticipated when the price of fruit was fixed.

Production and Sales.

Exports of Malayan canned pineapples for the three months subsequent to the last quarterly report were as follows: November 1,793 tons, December 5,484 tons, January 1,855 tons.

The Ministry of Food announced that there was little possibility of further purchases by them of Malayan pineapples in the near future.

During the quarter a further release of 252,850 cases was made against the quota of 800,000 cases for the season October 1940 to March 1941.

Shipments of canned pineapple juice were made during the quarter to Canada and Saigon, Indo-china.

Government Research Station and Canning Factory.

The possible outlets for canned pineapples have been still further reduced during the quarter and the resulting surplus of fresh fruit is likely to create a problem unless other means of disposing of it are devised. Research work on pineapple jam was carried on with increased energy and some measure of success has been achieved. It has been found possible to produce a jam, consisting of pineapple, some papaya to give the required consistency, and a little fresh lime juice to enhance the flavour. The jam has an attractive flavour and appearance and conforms with the highest specification for jams laid down by The Food Manufacturers Federation in England. Samples of this jam which were submitted to the Ministry of Food in England received favourable comment, and the distributors are optimistic of the chances of developing a considerable market for this product as it is both attractive and cheap.

One factory has been producing this jam commercially for the past two months and a constant check on the sugar content and quality has been kept by the Canning Officer. The results of the tests have shown consistently good quality and may be regarding as highly satisfactory. Owing to the shortage of suitable equipment for jam boiling the output so far has not exceeded 600 cases of 72 1 lb. cans per month but eight more large boiling pans have been ordered, some of which are already on the way and when these arrive the output should be in the neighbourhood of 5,000 cases per month. In order to keep a check on the quality and manufacture of pineapple jam, regulations have been drafted specifying quality standards, and it is proposed to promulgate these under the Pineapple Industry Ordinance.

Investigations have been carried out with a view to drafting regulations specifying the quality of Malayan pineapple juice. At present only two factories are producing pineapple juice in Malaya and it is a comparatively easy matter to keep a watch on the pack produced by them; regulations would be necessary should the business increase.

Routine canning trials were carried out and reports on the quality of the canned pineapples prepared, on selected pineapples from the Government Pineapple Research Station in Johore; by this means the suitability for canning of various strains of pineapples can be compared.

War Office specifications for canned goods usually specify that cans should be lacquered externally, and since negotiations are being conducted to supply canned pineapples to the military authorities in India and the Middle East the question of lacquering cans has become increasingly important. Several samples of lacquer

were obtained from England, and cans coated with these were subjected to vigorous tests. The results show that the lacquers tested afforded a considerable measure of protection; weathering trials are being continued.

Samples of a new rubber compound for sealing cans, in place of the rubber rings at present employed in Malaya, were obtained from a firm in England and tested. These compounds were found to be extremely satisfactory, and from these investigations appear superior to the more costly samples obtained from America.

Experiments were carried out to prepare dried pineapple but the results were not encouraging as the dried pineapple would not return to normal when soaked and the flavour was unpleasant. Samples of crystallized pineapple were prepared and were considered satisfactory but owing to the humidity of the atmosphere in Malaya it would be impracticable to produce this on a commercial scale without elaborate drying apparatus.

Considerable research work has been carried out during the quarter on canning local and imported vegetables and other products on behalf of the local civil and service authorities. The results of the canning trials on vegetables have been particularly successful.

General.

Increasing abandonment of pineapple cultivation is becoming more pronounced, due to declining productivity and hastened by transport difficulties, lack of buying competition and increasingly diminishing demand for small and inferior fruit.

Small-holding cultivators of pineapple are showing interest in obtaining land for production of food crops.

Reviews.

Agriculture in Uganda.

By the Staff of the Department of Agriculture. Edited by J. D. Tothill, D.Sc. 551 pp. 30 plates. 5 maps and charts. Oxford University Press. London: Humphrey Milford, 1940. Price 20 shillings net.

The reviewer has frequently found a singular reticence amongst people at Home in discussing our Colonial Empire other than in very general terms, due we imagine, to a lack of knowledge of the countries under reference. Various institutions, such as The Royal Empire Society, and publications such as *The Crown Colonist*, endeavour, with some success, to inform the public, but it must be admitted that in the main they address their propaganda to the initiated.

During recent years the Colonies themselves have seriously entered the field of propaganda and much informative literature has been written by competent authorities. Such publications provide the ammunition for the publicist, but they do more — they form a valuable link between the colonies in that they present in suitable form individual problems and describe the methods by which they are solved.

One such volume has recently come to our notice, Agriculture in Uganda, under the editorship of Dr. J. D. Tothill, who now holds the position of Director of Agriculture, Anglo-Egyptian Sudan, but who for over 10 years was Director of Agriculture, Uganda. The book is a fitting memorial to Dr. Tothill's service in Uganda and a credit to the members of the Department who are the authors of the chapters of this book, which, in the form in which it is presented, gives a comprehensive account of the agriculture of the country.

Prominence is given to cotton and coffee — the two most important crops of the country, about one-quarter of the book being devoted to these two crops, while one-fifth of the book concerns the insect pests of the various crops discussed. We incline to the opinion that the book is over-weighted with detail in these respects, detail which could more usefully have been relegated to separate publications, but this criticism in no way detracts from the general usefulness of the book.

Of particular interest, perhaps because investigators in other countries generally find such information difficult to procure, are the sections dealing with topography and climate, native agriculture, soils, agricultural education and extension work, for it is on such data as this that workers in other countries are able to consider the corresponding problems in their own country and to judge how far methods which have made for success in one country may usefully be tried in another.

There is much that may be learned from this book and we believe that it will remain for many years a standard authority. Perhaps the best commendation we can give is to hope that other colonies that have not already done so, may provide us with equally comprehensive accounts of their work in much the same form, for such books assist materially in co-ordinating effort between colonies and extend our vision beyond the narrow confines of our own immediate surroundings.

D. H. G.

Report on the Commercial and Economic Progress of Thailand 1939 - 40.

Thai Commercial Development Bureau, Bangkok, Thailand.
174 pp. Price Baht 3.50 post free.

The Thai Commercial Development Bureau have published this useful Report with the object of establishing closer contact between importers and exporters overseas, and to show the trade potentialities in their country.

The reader is given a concise description of the country, its history, government, and religion. In the compass of some 25 pages the compiler deals with the chief natural resources of Thailand — minerals, agriculture, livestock, fisheries and forestry; followed by sections descriptive of its industries, irrigation and drainage, trade and commerce, communications and transport, and other statistical features.

Pride of place is given to the agricultural aspect of the country, justified by the fact that the population of Thailand is to-day dominantly agricultural. The most important crop is rice, of which there are over 8½ million acres, yielding nearly 3½ million tons of rice. The various classifications of rice are given from which it is seen that the upland crop, grown in little table lands cleared of jungle, produces the best rice for the table, but is mostly consumed locally. White "Garden rice" is judged to be the best for export; Lowland rice, which comes third in the category of quality is the class largely exported to China and Malaya. The commercial grades of rice are described together with the manner in which each is obtained during milling.

In comparison with rice the other agricultural products of Thailand are relatively unimportant. Coconut cultivation is one of Thailand's oldest industries, with an area of about 120,000 acres. Most of the produce is consumed locally and it is noted that the local production of coconut oil has increased considerably of recent years.

Tobacco occupies nearly 30,000 acres. The report states that much Virginia-type tobacco is now grown under the encouragement of the Government and it is hoped that before long Thailand will play an important role in exporting cured tobacco leaf.

Other crops mentioned are maize 19,000 acres, consumed locally, cotton 14,500 acres, kapok, sesamum, pepper, groundnuts, soya bean, tapioca, arecanut, cardamom, nutmegs and spices, vegetables and fruits.

Information of value is also given regarding the present position of the rubber industry in Thailand. Rubber is considered to be the most important crop, both in relation to the area under cultivation and the monetary value of the crop. The total area planted with rubber in Thailand is estimated to be about 900,000 rai (355,800 acres). "A great deal of this rubber is jungle grown," the Report continues, "in particular in the country bordering on Malaya. The main areas of production are Naradhivas (200,000 rai), Yala (150,000), Song-Khla (150,000), Trang (100,000) and Pattani (80,000). Thailand is a party to the international scheme of rubber restriction. Her acreage of planted rubber at the end of 1939

is given as 54,500." It is difficult to reconcile this figure of 54,500 acres, with Thailand's own estimate of 355,800 acres! The exports in the Thailand year 2481 (A.D. 1938-39) were 47,394,668 kgs. (about 104,300,000 lbs.) which for 54,500 acres would be at the rate of about 2000 lbs. of dry rubber per acre, whereas on 355,800 acres it shows a yield of about 300 lbs. per acre, which, in view of restricted production, would appear to be nearer the truth.

The reviewer has emphasized those portions of the Report which deal with the agriculture of Thailand. Those interested in forestry or mining will find equally that the volume contains much information on these subjects, while merchants desiring to open trade relations with Thailand will find in the Report much food for thought in the data given, and a ready reference book on matters connected with the trade and industry of our neighbouring country.

D. H. G.

Notes and Comments.

ANNUAL PRIZE DISTRIBUTION, SCHOOL OF AGRICULTURE, MALAYA.

The annual prize distribution at the School of Agriculture, Malaya, took place on 10th April, 1941. Amongst those present, in addition to the staff and students, were the Hon'ble the Federal Secretary (Mr. H. Fraser), the Hon'ble the Adviser on Agriculture (Mr. W. N. C. Belgrave), and members of the School Advisory Committee.

The Principal of the School (Mr. G. E. Mann, M.C.) extended a welcome to the visitors and outlined the activities and progress of the School during the year.

Progress of the School.

Mr. Mann reminded his listeners that the School had now completed its tenth academic year. The number of students had been well maintained and was at the moment 71. Of these, 23 had completed the Two Year Course and 24 the One Year Course and were therefore leaving the School that day. It was expected that when the School reopened in May there would be about 75 students, which was a few more than usual owing to a larger number of applications for admission to the One Year Course as private pupils. Every vacancy in the next Two Year Course had been filled and admission had of necessity been refused to about 20 candidates as private students.

So far as class and field work were concerned, the School had followed the same lines as during the past few years, with emphasis on the cultivation of food crops. Poultry research was still on a very limited scale and had dealt mainly with the problem of wartime rations.

Employment.

Having spoken of the numerous staff changes during the past year, the speaker turned to the subject of employment and stated that employment was found for 18 of the Two Year Course students who left a year ago, while 5 were believed to be unemployed. For the One Year Course, 11 and 7 were the corresponding numbers.

Records from 1931 to 1940 inclusive, which had recently been reviewed in detail, gave the following facts —

Major Course — total number of students 155; number found employment, 123.

Minor Course — total number of students 166; number found employment, 117.

Of the posts in the former category, 36 were in various Agricultural Departments of the Malayan "group," 45 in the Rubber Research Institute and 18 on estates. Casualities had numbered 5, 4 and 1 respectively. Of those in the latter category, 81 were in Agricultural Departments (with 8 casualties) and 7 on Asiatic-

owned estates. For some students leaving that day, prospects were obscure. Four 2nd year and 8 One Year Course students were proceeding to Unfederated Malay States agricultural appointments, while 2 vernacular school teachers who had spent a year at the School as an experiment were returning to the Education Department. The Selangor Penghulu would also resume duty as such. The Rubber Research Institute would absorb a few Malays and Chinese and the speaker had recently been approached by a Chinese group of estates; but, so far this year, there had been only one enquiry from a European-owned estate.

The Hon'ble Mr. Fraser in addressing the students outlined some of the effects of the war on Malaya. There was a possibility that one effect would be a blockade, lasting perhaps several months, during which time Malaya would be able to import little if anything. Government had laid in stocks of essential food sufficient for several months, but we must aim to be much more self-supporting in the matter of food than we were at present. The speaker did not advocate the wholesale planting of perishable food-crops for which there was no ready market, but he thought that every landowner should plant vegetables and kindred things sufficient for the needs of his labour force; and he suggested to Malays that they should seriously consider the feasibility of all planting something which could be used instead of or in addition to rice.

"There is no doubt," concluded Mr. Fraser, "that rice will be rationed immediately if Malaya is attacked and it is here that I feel that you lads passing out of this school with your certificates and diplomas can do an immense amount of good. I am not suggesting that you know all there is to know about agriculture but your diploma does confer upon you a distinction which is not shared by those who do not possess it and your opinion amongst them is greatly enhanced. I ask you all to use your influence not only for the benefit of Malaya but in the knowledge that by so doing you will be helping the Empire in her fight against the aggressor."

At the conclusion of the proceedings Mr. H. R. Cheeseman addressed the non-English speaking students in Malay, telling them what the Federal Secretary had said and urging them to remember that, in some ways, their agricultural education had only just begun.

"GIFT TEA" TO THE UNITED KINGDOM.

The Ministry of Food has amended the regulations, published in *The Malayan Agricultural Journal,* October 1940, affecting the import into the United Kingdom of gifts of tea.

The amended regulation states that no parcels of tea despatched from abroad after 10th March 1941 may contain more than 2 lbs. of tea. In addition, the special arrangements are cancelled whereby exporters were allowed to consign gifts in bulk for posting in the United Kingdom. In future gifts of tea must be consigned direct by parcel post.

STORAGE OF VEGETABLE SEEDS.

There is a marked paucity of information on the subject of practical methods of storage of vegetable seeds in the tropics. It is known that vegetable seeds, especially those imported from temperate climates, lose their viability very rapidly. An article on this subject recently published in *The Philippine Journal of Agriculture** throws more light on the subject and presents a practical method for storage of seed under tropical conditions.

Previous work by other investigators showed that insect attack, high temperature and high moisture were limiting factors affecting the life of the seed. Seed will endure high moisture if the temperature is low, and comparatively high temperatures if the moisture is low. Other investigators proved that seed stored in sealed containers with and without naphthalene remained strongly viable from two to four years while those in cloth bags lost their viability in less than a year, with a few exceptions. It has also been shown that moisture exerted more influence on the viability of seeds than temperature.

In these most recent experiments ten different kinds of vegetable seeds were used, *viz.*, Surehead cabbage, *Brassica olcracea* var. *capitata* L.; Early Patna cauliflower, *Brassica oleracea* var. *botrytis* L.; Chinese pechay, *Brassica cernua* Tumb.; Chinese long radish, *Rhaphanus sativus* L., Big Boston lettuce, *Lactuca sativa* L.; Yellow Bermuda onion, *Allium cepa* L.; Japanese purple egg-plant, *Solanum melongena* L.; Bontoe pepper, *Capsicum frutescens*; Mary Washington asparagus, *Asparagus officinalis* L.; and cucumber, *Cucumis sativus* L. With the exception of the asparagus, egg-plant and pepper which were produced locally, no information was available regarding the age of the other seeds which were imported. It was assumed that they were comparatively new.

Seeds before storage were thoroughly dried at a temperature ranging from 45° to 50°C. for about two days, as were also the storage receptacles, and the seed was placed in the storage vials while still warm. Two conditions of storage were employed, *viz.* sealed and unsealed vials. Thus the seeds were stored (1) under air-tight conditions and (2) under the influence of air and its relative humidity.

Seeds stored in corked but unsealed containers lost their viability within a comparatively short period. For example, the cabbage and lettuce seeds began to be critical in their viability in 3 to 4 months respectively after storage; cauliflower and cucumber in 6 and 5 months respectively; pepper in 6 months; onion in 8 months; radish in 10 months; pechay in 10 months, and egg-plant and asparagus in 13 and 14 months respectively. The deterioration of seeds in the corked but unsealed containers was rapid after their viability became apparently critical. The cabbage completely lost its viability after 6 months, cauliflower in 11 months, cucumber in 13 months, pepper in 17 months, onion in 13 months, lettuce in 8 months, radish in 18 months, asparagus, egg-plant and pechay in 21 months. In this connexion it may be stated that a corked vial is a better storing receptacle than either cloth or paper bag, the usual containers.

* Storing Some Vegetable Seeds by P. A. Rodrigo and Alfonso L. Tecson. *Philippine Journal of Agriculture*, Vol. 11, No. 4, 1940.

The different seeds that were kept in corked and sealed containers kept their viability much longer than their counterparts which were kept in corked but unsealed containers. The following are the critical periods, in months: radish 21, cauliflower 37, cabbage 23, pechay 41, lettuce 17, cucumber 17, onion 15, asparagus 38, egg-plant 28, pepper 41, while at this time pechay was still strongly viable and pepper was still giving a fair viability. The range of longevity of the seeds in the corked and sealed containers varied from 27 months to over 41 months. The lettuce seeds completely lost their viability after 27 months in storage, cabbage after 36 months, onion after 38 months, cauliflower, radish and cucumber after 39 months, asparagus after 40 months. Egg-plant, pechay and pepper were still germinating after 41 months in storage.

It was noted that there was a temporary rise in the percentage of germination of most of the seeds after they had shown some signs of weakness in their germination.

The above interesting work should be used as a guide to the storage of vegetable seeds in Malaya. Seed should be dried and immediately placed in a sealed container. A ground-glass well-fitting stopper effectively vaselined should prove effective, or the seed may be placed in a cork-stoppered bottle, the corked ends being dipped in melted paraffin or sealing wax.

DEPARTMENTAL NOTES.

Leave.

Mr. G. D. P. Olds, Agricultural Officer, returned from leave on the 18th April 1941, and assumed duty as Agriculturist, Central Experiment Station, Serdang, with effect from 22nd April.

Departmental.

FROM THE DISTRICTS.

Compiled in the Office of the Chief Field Officer from Monthly Reports of Agricultural Officers.

April, 1941.

The Weather.

Rain has been plentiful and in most parts of the country the total precipitation approximated to normal. In parts of Perak heavy rain occurred and there were floods, but they were not serious and soon subsided. In Johore the total rainfall was above the average.

Crop Reports.

Rubber. — Rubber prices tended to increase. In country districts good quality smoked sheet reached a price of $47 per picul. Uncouponed rubber was selling at $23 per picul. With prices at this level it is perhaps not surprising that many small-holders are reluctant to undertake replanting.

In the neighbourhood of towns there is a ready sale for all rubber wood and firewood contractors will often fell and stump a holding in return for the wood.

In spite of the fact that restriction on the import of sulphuric and hydrochloric acids has now been in force for many months various brands of coagulants containing these acids are still on sale in Johore; inquiries have been instituted to ascertain the source of these acids. In other parts of the country the use of acetic acid is now becoming far more general.

Padi. — The harvest in Kedah is now over and a preliminary estimate places the crop at approximately 100,000,000 gantangs, and it is considered possible that when all returns have been completed the total may exceed the record 1938-39 crop of 100,483,000 gantangs.

In Perak generally the crop has been below normal and in the late planted areas of South Krian and some areas in the Central Circle it has been very poor. In the Krian report it is stated that growers are retaining more padi for their own use than they have been accustomed to do in the past; 20,000 gantangs of S.K. 48 have been obtained for distribution as seed in South Krian.

In Pahang the crop has been poor. Work on cultivating the land for the new crop has commenced under favourable conditions.

In Selangor, harvesting at Sabak Bernam has been completed and the crop is reported to have been good, averaging 350 to 400 gantangs per acre. In the Kuala Selangor area results have been less satisfactory, though a good crop is being harvested in the Sempadan area.

An excellent crop was reaped in parts of Malacca, but in those parts of Central District which were affected by soil acidity (mentioned in a previous month) the crop was a complete failure. Steps are being taken to assist cultivators in these areas by providing them with free seed to plant the next season's crop.

In the Sungei Manik area of Perak little padi is being sold and there has been no demand for inspection and sealing of S.K. 48. Teluk Anson dealers are paying $2.60 to $2.70 per picul, but within the area the price is only $8 to $10 per 100 gantangs ($2 to $2.50 per picul).

Coconuts. — In Johore the price of copra is reported to have reached the extremely low figure of $1 per picul. Where it was possible to sell nuts for consumption or for local manufacture of oil slightly better prices were obtained.

Tobacco. — The shortage of imported cigarettes has led to increased production of locally-made cigarettes, a considerable increase in prices paid for locally-cured leaf, and an expansion of the area under the crop in Penang, Perak, and Pahang. A new cigarette factory has been opened in Malacca. In Penang the local cigarette factory is offering 60 cents per kati for dry leaf. One kati is sufficient to make 640 cigarettes at a total cost of $1, and they are sold for $1.60.

Vegetables. — Suppliers to the Ipoh and Batu Gajah markets complained that the maximum prices fixed were too low, and there was a shortage of vegetables in these markets during the earlier part of the month. After adjustments had been made to the fixed retail prices the supply returned to normal. Similar difficulty was experienced in the Katong market in Singapore.

For several months trial consignments of choice vegetables, carefully packed, have been despatched from the Tanah Rata Agricultural Station, Cameron Highlands, for sale in the Singapore vegetable market, and satisfactory prices have been received. Tomatoes and lettuce have commanded particularly good prices as shown by the following extract from the Monthly Report of the Agricultural Officer, Cameron Highlands:—

> " During the month, consignments of vegetables were sent to the wholesale dealer in Singapore twice per week. Altogether 20.50 piculs were sent, realizing a gross return of $597.60 or, deducting the 5 per cent. commission on sale, $567.88 nett. This gives an average nett return of $27.70 per picul. Tomatoes accounted for 14.46 piculs with a nett return of $401.18 or $27.81 per picul. (These were cropped from an area of about 1/10th acre, including access paths). Lettuce accounted for 178 kati sold for $128.85 nett, or $72.39 per picul. The lettuce was grown on a measured plot of approximately 1/40th acre including paths. All vegetables except roots (turnips, lobak) were packed in returnable wooden crates, and losses were nil, weights as despatched corresponding almost exactly with returns credited."

Fruit. — In North Kedah there is an exceptional dearth of local mangoes. Most of the trees failed to flower or only flowered very sparsely. This feature is attributed to the unusually heavy rainfall experienced in February (over 10 inches at Gajah Mati against an average of 1.42 inches). It is generally considered that

dry weather stimulates the flowering of mangoes, and it is probably for this reason that all types of mango are more successful in Kedah, where there is normally a very pronounced dry season, than in some other parts of the country.

Livestock.— Owing to the presence of Indian troops the demand for live goats for meat is great. In Perak it has been noted that goats are now being brought direct to the barracks for sale. At the present time goat rearing should be a profitable undertaking for the small-holder if marketing could be satisfactorily organized. In Selangor coastal areas goat keeping is increasing but demand still exceeds the supply.

Owing to difficulty in obtaining supplies of bran and other feeding stuffs many Chinese pig keepers in Selangor have been selling their stock. Every effort has been made to encourage these people to increase their cultivation of food crops and to keep as many pigs as possible. It appears that these efforts have met with some success as breeding animals are not now being sold and the price of live pigs is increasing.

As a result of the poor padi crop in Pahang it is reported that poultry owners are selling their birds. The same tendency has also been noted in Perak.

Farm Schools.— Although every effort was made to obtain pupils for the Farm School at Ayer Itam, Penang, the new term started with only 4 boys.

The Malacca Farm School is also suffering from a shortage of pupils. This School caters for Malay boys from rural areas, and boarding facilities are provided. Last year's course was fully attended but this year, owing to shortage of labour and greater prosperity in the villages, any youth can obtain good wages as a rubber tapper or casual labourer. There are, also, at present many openings in the Navy, R.A.S.C. and Malay Regiment. All these are factors which tend to reduce the number of boys who would wish to undergo training at the School.

Hill Land in Penang. — Now that clean-weeding is forbidden in permanent holdings, many land owners are planting cover crops in their rubber, fruit and clove plantations. It has been found that Hill Guards, whose work is concerned in preventing breaches of the Hill Lands Ordinance, can be of great assistance in promoting soil conservation work. Cover crops have also been established on the terraces of one group of vegetable gardens; it remains to be seen whether or not this will be successful.

A Local Paper-making Industry.— In view of the present situation with regard to supplies of paper in this country, it is of interest to record that a local paper manufacturing industry has sprung up at Degong in Perak. The factory is run by Chinese who turn out a coarse wrapping paper, manufactured from padi straw. The straw is collected from some 50 acres of padi land and the growers are paid $1 per acre. The padi straw is boiled with caustic soda for 4 hours, and then thoroughly washed and pulped by *"lesong kaki"* (a foot-operated pounder normally used for hulling padi). The pulp is mixed with water, poured into gauze-bottomed trays and sun-dried. Each tray can make only one sheet of paper at a time but the process can be repeated four to five times on a dry day. No bleaching material or filler is employed. This paper is sold in Kampar and Teluk Anson at $15 per picul.

Statistical.

MARKET PRICES.

April, 1941.

Rubber. — There was a further considerable improvement in the Singapore market during April. No. 1. X. Ribbed Smoked Sheet opened at 38 3/8 cents per lb. and rose steadily throughout the month to close at 40¾ cents.

The average of daily quotations for the month was 39.39 cents per lb., as compared with 38.06 cents in March. The London average price was 14.22 pence per lb., and New York 22.61 cents gold, as compared with 13.91 pence and 21.99 cents gold in March.

Prices paid for small-holders' rubber at three centres during the month are given in Table I. ...

Table I.

Weekly Prices Paid by Local Dealers for Small-Holders' Rubber, April, 1941.

(Dollars per picul of 133 1/3 lbs.)

Grades	Kuala Kangsar, Perak					Kuala Pilah, Negri Sembilan				Batu Pahat, Johore.				
	2	9	16	23	30	3	10	17	24	2	9	16	23	30
Smoked Sheet ...	—	43.97	—	44.00	46.19	44.51	—	45.80	46.00	44.00	—	45.00	45.32	47.00
Unsmoked Sheet ...	40.00	40.00	42.07	42.00	41.82	—	43.00	43.00	44.00	41.00	41.50	43.30	42.60	44.30
Scrap ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Transport by F.M.S.R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8 per ton.

Transport from Batu Pahat to Singapore by lorry, excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

Table II.

Singapore Prices of Various Agricultural Products.

Product	April, 1941			March, 1941	Average Price 1940
	Highest	Lowest	Average	Average	
	per picul $	per picul $	per picul $	per picul $	per picul $
Copra :					
Sundried ...	2.50	2.50	2.50	2.50	3.08
Mixed ...	2.25	2.25	2.25	2.25	2.76
Coconut Oil ...	—	—	7.50	7.50	8.29
Copra Cake No. 1 ...	‡	‡	‡	‡	1.43
No. 2 ...	1.60	1.60	1.60	1.60	‡
Pineapples, Canned :*					
G.A.Q. : Cubes ...	4.85	4.85	4.85	4.85	4.85
Sliced ...	4.80	4.80	4.80	4.80	4.80
Tall ...	4.95	4.95	4.95	4.95	4.95
Golden : Cubes ...	5.45	5.45	5.45	5.45	5.45
Sliced ...	5.40	5.40	5.40	5.40	5.40
Tall ...	5.55	5.55	5.55	5.55	5.55
Coffee :					
Liberian ...	16.50	15.50	15.75	15.50	16.10
Excelsa ...	13.50	12.50	12.75	12.50	13.69
Robusta ...	10.50	9.50	9.75	9.25	8.92
Palembang ...	16.75	13.75	14.12 - 16.38	16.69 - 18.06	13.00†
Sourabaya ...	19.00	15.00	15.38 - 18.56	18.00 - 19.12	14.80†
Arecanuts :					
Best ...	6.40	5.75	6.08	6.36	5.65
Medium ...	5.75	5.25	5.50	5.85	5.24
Mixed ...	5.25	5.00	5.12	5.35	4.88
Splits ...	7.50	5.25	5.56 - 7.44	5.62 - 7.62	6.33†
Red Whole ...	9.75	7.00	7.44 - 9.06	6.12 - 8.12	6.67†
Sliced ...	23.00	18.50	19.00 - 21.81	8.56 - 10.37	10.79†
Pepper :					
Singapore Black ...	7.25	7.00	7.12	7.00	7.29
Singapore White ...	14.00	13.50	13.88	13.80	‡
Muntok White ...	14.50	14.25	14.44	14.30	13.51
Nutmegs :					
110's ...	24.00	22.00	23.25	24.00	26.11
80's ...	24.50	23.00	24.00	24.50	30.65
Penang, dried¶ ...	—	—	16.50	16.00	21.00
Mace :					
Siouw ...	‡	‡	‡	‡	‡
Amboina ...	‡	‡	‡	‡	39.85
Penang, dried¶ ...	—	—	40.00	40.00	63.50
Cloves :					
Zanzibar ...	41.00	40.00	40.50	40.00	‡
Amboina ...	43.00	42.00	42.50	42.00	‡
Penang, dried¶ ...	‡	‡	‡	‡	72.00

* per case of 48 cans of 1¼ lbs. each.
† Highest of the average monthly range quotations.
¶ Penang prices.
‡ Not quoted

Product	April, 1941			March, 1941	Average Price 1940
	Highest	Lowest	Average	Average	
	per picul $	per picul $	per picul $	per picul $	per picul $
Gambier:					
Block ...	‡	‡	‡	‡	‡
No. 1 Cube ...	14.50	14.50	14.50	14.50	15.00
Sago:					
Pearl ...	9.00	8.75	8.84	8.50	7.79
Flour, Sarawak Fair ...	6.15	4.50	5.16	4.50	4.95
Tapioca:					
Flake Fair ...	7.00	6.50	6.75	6.84	8.08
Seed Pearl ...	8.25	8.12½	8.22	8.05	9.45
Medium Pearl ...	8.25	8.00	8.12	7.95	9.07

Palm Oil. — No recent information is available regarding prices paid in the United Kingdom for Malayan palm oil.

Local sales of palm oil in sellers' drums were made during April at the following prices per ton:— unbleached oil 5 per cent. f.f.a. f.o.b. Port Swettenham $130, $133, $135 and $150; f.o.b. Singapore $142, $147.50 and $150.

Rice. — The Singapore average wholesale prices of rice per picul in April were as follows:— Thailand Broken 1st Grade "A" $6.67, Thailand Broken 2nd Grade "A" $6.42, Burma S.Q. Meedone $6.17, Burma Parboiled Milchar No. 2 $5.19. Thailand 3rd Grade "A" and Annam White Rice No. 1 were not quoted.

Average retail prices of No. 2 Thailand rice were not quoted for February.

The average declared trade value of imports during February was $6.37 per picul, as compared with $6.47 in January and $5.91 in December.

Padi.— The Government Rice Mills, Perak, are paying a guaranteed price of $2.50 per picul for padi, plus a bonus of 10 cents per picul for pure strain S.K. 48 padi, but the Teluk Anson mill increased its price to $2.80 to $2.90. There were again no purchases of padi at the Government Rice Mill, Temerloh, Pahang.

Retail prices of padi in cents per gantang (gallon) were as follows:—Kedah 9½, Penang and Province Wellesley 11¾, Perak, South Krian 9¼ to 10¼, Selama 15, no sellers, Perak Central 15 to 20; Perak South, Sungei Manik 8 to 10, Teluk Anson 11 to 13, Kinta and Batang Padang 18 to 21; Selangor, Sabak Bernam (in the *kampong*) 8½ to 9; Pahang North 10 to 23; Pahang South, Temerloh District 12 to 18, Bentong District 21 to 22; Malacca 16 to 18; Kelantan 13½.

Tea.— There are no London tea sales.

The latest Colombo prices available, quoted from *The Ceylon Tea Market Report* of 29th April 1941 of the Colombo Brokers' Association are as follows, in rupee cents per lb.: High Grown Rs. 1.10, Medium Grown Rs. 1.02, Low Grown 96.

Cardamoms.—Green cardamoms were quoted in *The Ceylon Chamber of Commerce Weekly Report* of 28th April 1941 from Rs. 2.10 to Rs. 2.30 per lb.

Derris.— The demand was satisfactory during April but supplies reached Singapore in such large quantities that towards the end of the month prices tended to weaken. Average prices for the month, however, remained unchanged, and were, per picul: $9.50 to $11 for roots sold on a basis of ether extract; $18 to $22.50 for roots with 4 to 5 per cent. rotenone content, rising to $27 to $28.50 for 7 to 9 per cent. rotenone.

Tobacco.— Prices of prepared tobacco per picul in Kelantan were: 1st quality $115 to $150, 2nd quality $100 to $112, 3rd quality $80 to $90. Prices of dried leaf per picul were as follows:— Penang and Province Wellesley 1st quality $45.75, 2nd quality $37.50; Perak Central $70 to $75, $50 to $60, $30 to $48; Perak South $70 to $80, $60 to $70, $50 to $60, prepared tobacco 90 cents to $1.28 per kati; Pahang $40 to $60, $25 to $40, $15 to $30; Malacca $54 to $60; Selangor, Sabak Bernam (cut tobacco) $1.35 to $1.50 per kati.

The above prices are based on London and Singapore daily quotations for rubber, on the Singapore daily prices for copra, on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports and certain coffee prices are kindly supplied by Guthrie & Co., Ltd., Kuala Lumpur, local palm oil prices by Whittall & Co., Kuala Lumpur, the Singapore prices of imported coffee and arecanuts by Lianqui Trading Company of Singapore, and Singapore derris prices by Hooglandt & Co., Singapore.

1 picul = 133 1/3 lbs. The dollar is fixed at 2s. 4d.

Note. — The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Trafalgar Square, London, W.C.2.

FERTILIZER PRICES, MAY, 1941.

The following are the prices current for the month of May 1941 of the more important fertilizers of which stocks are available.

	per ton $	
Nitrate of soda	125	
Muriate of potash	200	
Rock phosphate (Christmas Island)	37	($35 Singapore).
Lime	20	

Quotations are *ex* warehouse, Port Swettenham, Klang, Singapore and Penang.

Supplies of sulphate of ammonia, superphosphate, basic slag, calcium cyanamide, sulphate of potash, and rock phosphate (Gafsa) are not available.

MALAYAN AGRICULTURAL EXPORTS, JANUARY, 1941.

Product	Net Exports in Tons		
	Year 1940	January 1940	January 1941
Arecanuts ...	43,915	4,720	4,934
Coconuts fresh†‡ ...	131,469†	7,107†	13,369†
Coconut oil‡ ...	69,446	5,644	6,531
Copra‡ ...	9,904*	1,706*	4,313*
Copra cake ...	1,215*	503	5,307
Gambier, all kinds ...	821	45	79*
Palm kernels ...	9,219	746	1,075
Palm oil ...	55,990	2,946	4,361
Pineapples, canned ...	40,243	5,583	1,855
Rubber¶ ...	549,327¶	57,680¶	52,832¶
Sago,—flour ...	2,525	1,352*	1,420
,, —pearl ...	4,848	374	215
,, —raw ...	4,816*	337*	157*
Tapioca,—flake ...	762	136	36
,, —flour ...	2,649*	158	110*
,, —pearl ...	17,004	227	1,599
Derris ...	1,258	143	49
‡Copra equivalent ...	108,468	7,608	6,839

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION OF PALM OIL AND KERNELS

(In long tons, as declared by Estates)

Month 1941	Palm Oil			Palm Kernels		
	F.M.S.	U.M.S.	Malaya	F.M.S.	U.M.S.	Malaya
January	1,872.7	1,221.4	3,094.1	170.3	150.0	320.3
February	1,698.3	993.2	2,691.5	167.1	179.3	346.4
March	2,179.8	1,710.1	3,889.9	180.5	274.9	455.4
Total	5,750.8	3,924.7	9,675.5	517.9	604.2	1,122.1
Total January to March, 1940 ...	6,027.0	6,265.7	12,292.7	1,290.7	1,339.1	2,629.8
Total for the year 1940	29,875.2	28,096.9	57,972.1	4,513.1	5,098.1	9,611.2

Stocks on estates as at 31st March, 1941 were : palm oil 4,077 tons, palm kernels 935 tons.

ACREAGES OF TAPPABLE RUBBER ACTUALLY TAPPED AND NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST MARCH, 1941.

STATE OR TERRITORY	Estimated Acreages of Tappable Rubber (9) + (11)	ACREAGES OF TAPPABLE RUBBER NOT TAPPED				Area of tappable rubber never been tapped (b)		Total area not tapped (3) + (5) (c)		TOTAL AREA TAPPED DURING THE MONTH		Area of tappable rubber rested under rotational systems (c)	
		On estates which have entirely ceased tapping		On estates which have partly ceased tapping (a)									
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)	Acreage	Percentage of (9) to (2)	Acreage	Percentage of (11) to (2)	Acreage	Percentage of (13) to (2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
S.S.—													
Province Wellesley ...	42,117	204	0.5	5,993	14.2	303	0.7	6,197	14.7	35,920	85.3	7,905	18.8
Malacca ...	110,084	413	0.4	7,868	7.1	439	0.4	8,281	7.5	101,803	92.5	16,087	14.6
Penang ...	2,595	63	2.4	708	27.3	35	1.3	771	29.7	1,824	70.3	60	2.3
Singapore ...	29,208	1,913	6.5	5,104	17.5	311	1.1	7,017	24.0	22,191	76.0	2,109	7.2
Total S.S. ...	184,004	2,593	1.4	19,673	10.7	1,088	0.6	22,266	12.1	161,738	87.9	26,161	14.2
F.M.S.—													
Perak ...	274,103	585	0.2	16,197	5.9	3,114	1.1	16,782	6.1	257,321	93.9	30,553	11.1
Selangor ...	302,234	1,118	0.4	13,138	4.3	1,994	0.7	14,256	4.7	288,028	95.3	32,831	10.9
Negri Sembilan ...	248,891	2,008	0.8	23,498	9.4	4,108	1.6	25,506	10.2	223,385	89.8	21,085	8.5
Pahang ...	84,814	5	0.0	7,044	8.3	2,244	2.6	7,049	8.3	77,765	91.7	4,012	4.7
Total F.M.S. ...	910,092	3,716	0.4	59,877	6.6	11,460	1.3	63,593	7.0	846,499	93.0	88,481	9.7
U.M.S.—													
Johore ...	468,095	5,051	1.1	39,441	8.4	18,918	4.0	44,492	9.5	423,603	90.5	49,491	10.6
Kedah ...	186,848	5,229	2.8	9,676	5.2	3,699	2.0	14,905	8.0	171,943	92.0	23,531	12.6
Kelantan ...	30,398	403	1.3	4,095	13.5	727	2.4	4,498	14.8	25,900	85.2	3,281	10.8
Trengganu (d) ...	4,817	nil	nil	nil	nil	nil	nil	nil	nil	4,817	100.0	1,661	34.5
Perlis (e) ...	1,260	nil	nil	202	16.0	90	7.1	202	16.0	1,058	84.0	194	15.4
Brunei ...	6,125	nil	nil	1,377	22.5	288	4.7	1,377	22.5	4,748	77.5	1,025	16.7
Total U.M.S. ...	697,543	10,683	1.5	54,791	7.9	23,722	3.4	65,474	9.4	632,069	90.6	79,183	11.4
Total MALAYA ...	1,791,639	16,992	0.9	134,341	7.5	36,270	2.0	151,333	8.4	1,640,306	91.6	193,825	10.8

Notes.—(*a*) Area out-of-tapping on estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(*b*) The acreage shown in column (7) is included in columns (3) and (5).

(*c*) Areas of tappable rubber rested under rotational systems are not considered as out-of-tapping and therefore (11) and (12) include columns (13) and (14) respectively.

(*d*) Registered companies only.

MALAYAN RUBBER STATISTICS Table I.

ACREAGE, STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF MARCH, 1941, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January to Mar. 1941		during the month		January to Mar. 1941						
	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to Mar. 1941	during the month	Jan. to Mar. 1941	Foreign	From Malay States	Foreign	From Malay States	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to Mar. 1941
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	7,645	21,082	14,459	47,710	3,820	19,432	Nil	Nil	Nil	Nil	11,707	11,356	36,979	32,291	...	4,386	19,417	140	423
Johore ...	...	3,110	7,753	7,626	22,313	3,874	15,074	Nil	Nil	Nil	20	3,079	10,900	7,909	30,286	...	1,711	6,673	...	...
Kedah ...	...	562	5,014	3,346	11,449	779	4,203	Nil	Nil	Nil	Nil	1,038	4,238	3,510	12,770	...	190	4,235	...	...
Perlis ...	...	23	31	19	57	23	84	Nil	Nil	Nil	Nil	Nil	40	Nil	151	...	22	34	...	...
Kelantan ...	...	348	489	496	1,361	459	1,676	Nil	Nil	Nil	Nil	190	899	402	2,655	...	255	448	...	...
Trengganu ...	...	107	183	235	631	436	1,072	Nil	Nil	Nil	Nil	5	725	10	1,624	...	90	141	...	...
Brunei ...	...	9	50	47	185	128	337	...	...	...	...	...	188	...	520	...	10	36	...	...
Total Malay States	...	11,804	34,602	26,228	83,706	9,519	41,878	Nil	Nil	Nil	20	16,019	28,346	48,810	80,297	...	6,664	30,984	140	423
S. SETTLEMENTS :—																				
Malacca ...	...	2,627	1,698	1,495	4,797	608	2,378	Nil		Nil		3,973		9,398		...	1,511	1,894	...	...
Province Wellesley ...	...	3,499	930	504	1,770	140	711	Nil		Nil		12,621		32,870		...	2,147	831	...	...
Penang ...	2,172	6,685	17	20	69	107	336	1,900	24,479	5,837	74,133		Nil		Nil	4,954	4,721	9	...	...
Singapore ...	13,465	24,591	296	199	555	225	466	16,191		59,437		42,007		95,440		12,512	18,839	272	26	75
Labuan ...	...	39	Nil	Nil	Nil	20	53	66		192		Nil		Nil		...	20	Nil	...	...
Total Straits Settlements ...	15,637	37,441	2,941	2,218	7,191	1,100	3,944	18,157	24,479	65,466	74,133	58,601	Nil	137,708	Nil	17,466	27,238	3,006	26	75
Total Malaya ...	15,637	49,245	37,543	28,446	90,897	10,619	45,822	18,157	24,479	65,466	74,154	74,620	28,346	186,518	80,297	17,466	33,902	33,990	166	498

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	P.We'sly M'cca. Labuan & Brunei	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	3,575	17,592	4,259	3,247	1,085	116
WET RUBBER	811	1,247	462	441	626	74
TOTAL ...	4,386	18,839	4,721	3,688	1,711	190

TABLE III
FOREIGN EXPORTS

PORTS	For month	Jan. to Mar. 1941
29	30	31
Singapore ...	54,152	127,351
Penang ...	14,232	40,242
Port Swettenham.	6,236	18,703
Malacca ...	Nil	222
TOTAL ...	74,620	186,518

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	Jan. to Mar. 1941
32	33	34
Malay States ...	44,331	128,974
Straits Settlements	3,894	11,196
MALAYA ...	48,225	140,147

Notes:—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained
2. The production of estates of less than 100 acres is estimated from the formula: Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month. + Consumption. *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Columns (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S and F.M.S., at Singapore on 29th April, 1941.

METEOROLOGICAL SUMMARY, MALAYA, MARCH, 1941.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes								Most in a day.	Number of days.							
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet	Total.			Precipitation .01 in or more	Precipitation .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more	Total.	Daily Mean.	Per cent.
												Amt.								
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						hrs.	hrs.	
Kuala Lumpur Aerodrome, Selangor ...	93.4	74.3	83.9	†	†	†	†	86.2	86.9	14.09	357.9	†	18	13	10	5	—	210.20	6.78	56
Port Swettenham Aerodrome, Selangor ...	90.6	73.9	82.3					87.1	86.6	14.96	380.0		20	19	8	—	2	215.55	6.95	57
Sitiawan, Perak ...	91.5	74.2	82.9					85.3	85.5	3.46	87.9		16	14	1	—	—	238.00	7.68	64
Ipoh Aerodrome, Perak ...	93.5	73.4	83.5					85.5	85.6	6.18	157.0		20	17	7	—	—	234.45	7.56	63
Temerloh, Pahang ...	94.0	73.8	83.9					89.5	88.4	3.03	77.0		9	8	4	7	—	242.35	7.82	65
Kuala Lipis, Pahang ...	93.1	73.4	83.3					86.9	86.3	1.64	41.7		7	6	2	13	—	219.85	7.09	59
Kuala Pahang, Pahang ...	88.3	76.8	82.5					90.7	89.0	3.02	76.7		11	7	—	—	—	253.45	8.17	67
Kallang Aerodrome, S'pore ...	88.8	76.5	82.7					84.8	85.7	5.24	133.1		17	13	3	—	—	196.90	6.35	52
Bayan Lepas Aerodrome Penang ...	89.5	75.3	82.4					86.1	86.2	5.95	151.1		13	10	4	—	—	240.45	7.76	65
Malacca Town, Malacca ...	89.2	75.3	82.3					87.4	87.0	2.13	54.1		14	11	4	—	—	235.25	7.59	63
Kluang, Johore ...	91.7	72.7	82.2					83.5	83.6	7.39	187.7		13	12	5	4	—	191.95	6.19	51
Mersing, Johore ...	87.1	74.2	80.7					85.2	83.9	3.13	79.5		13	8	—	—	—	243.65	7.86	65
Alor Star, Kedah ...	92.9	73.5	83.2					86.5	87.0	6.55	166.4		13	9	6	—	1	262.70	8.47	70
Kota Bahru, Kelantan ...	90.5	72.8	81.7					85.0	84.5	1.66	42.2		7	6	—	2	—	270.60	8.73	73
Kuala Trengganu, Trengganu	89.2	73.3	81.3					86.8	86.1	4.45	113.0		8	7	1	6	—	274.80	8.86	73
Labuan ...	89.4	77.8	83.6					89.2	89.6	10.45	265.4		14	12	1	—	1	235.60	7.60	63
HILL STATIONS.																				
Fraser's Hill, Pahang, 4268 ft.	75.3	63.5	69.4					73.7	73.5	7.73	196.3		14	12	3	8	—	170.45	5.50	45
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	75.2	54.2	64.7					71.1	70.4	10.50	266.7		16	16	—	2	—	175.80	5.67	47
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	75.7	60.7	68.2					*	*	10.41	264.4		16	15	—	—	—	202.00	6.52	54

* Not recorded.

† Restrictions have been placed on the supply of certain types of Meteorological information.